

Title: Erbe ICC 200 ESU	Date: 9-28-2017
By: Erbe, Tübingen & Georgia, USA	DISCLAIMER: THIS PROCEDURE PROVIDED "AS IS" AND WITH POSSIBLE FAULTS. USER MUST VERIFY BEFORE USE. NEITHER PROVIDER NOR WEBSITE ASSUMES ANY RESPONSIBILITY FOR ITS USE.
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1. General

Applies to model ICC200. The following checks are likely considered minimal. Actual adjustments, if needed, are in the service manual noted below.

2. Reference Documents

Instruction manual P/N 80104-401 or 10128.
Service manual P/N 80116-201

Note: A web search (include Bing) for these numbers preceded with "Erbe" often locates online copies.

3. Tools / Fixtures / Accessories

- Electrosurgical Analyzer: ex: Dempsey 443 or better.
- Patient Plate Cable, Bipolar Cable/Forceps.
- Hand Control Pencil/Cable, Footswitch.
- Safety Tester



ICC 200 ESU


4. Performance Verifications (Erbe recommends inspection on a yearly basis.)


4.1. Inspection

Check unit for any damage; i.e. connectors, knobs, the power cord and the footswitch with its cable and strain reliefs.

4.2. With no accessories plugged in, turn unit on.

After a brief self test, relevant visual displays will blink and the unit cannot be activated until any key on the front panel is briefly pressed. Verify that the up and down arrow power set buttons function. Change both settings from the original, and after turning power off then back on, verify that the new settings re-appear.

Verify that the  button can change the CUT mode effects (i.e., various "Blends" ex: "1", "2", "3" and "4")

Verify that the  button can change the COAG mode effects (i.e., "Forced", "Soft" and "Bipolar").

Verify "Endo Cut" and "Auto Start"???

4.3. Neutral/Patient Plate/ Return Electrode (aka NESSY)

Note: To enable normal generator operation, the unit must see a resistance of 0–40 ohms between these two connector pins. Between 40 and 120, the unit will operate but with warning indications. Above 120, the unit cannot be activated.

Check with a variable test resistor connected between the connector pins. When the resistance exceeds 120 ohms, the "NESSY" LED will extinguish. Remove the neutral plug from its panel connector. A loud non-adjustable tone will activate, and the red patient plate lamp will light. To re-calibrate the ohm level, perform Test Program 16, Adjustment 9 in the service manual.

4.4. Power Measurement Setup


Hit the ENDO-CUT button to turn off this function (LED should be out.)
Connect the analyzer's "active" jack to the ESU (using the chuck of a handcontrol pencil.)
Connect a return electrode cable between the generator's neutral connector (remove the plug's small plastic pin) over to the same on the analyzer. Be sure both "return" wires are tied together.
Set analyzer load to 500 ohms if available.

4.5. Pure Cut – aka Effect 4

Activate the unit in Cut mode, using a handcontrol pencil. The Cut indicator lamp and a continuous (adjustable) tone occur. Perform this operation for several power settings and note power into analyzer. Refer to table in Appendix for acceptable tracking results.
Repeat the above using just one power setting to verify output from the footswitch connector.

4.6. Effect 1, 2 These are blend modes. If checked, refer to Appendix.

4.7. Coag Mode

Verify that the  button in the coag panel can change the coag mode between "Bipolar", "Soft", "Forced", and "A-Forced". For this next test, select the A-Forced mode, otherwise output results will not agree with displayed power. Verify that the analyzer is set to 500 ohms.

Activate the unit in Coag mode, using either the coag pedal of the footswitch or the coag-rocker switch on the hand pencil. The Coag indicator lamp and a continuous (adjustable) tone occur. Perform this operation for several power settings and note power into a 500 ohm analyzer. Refer to table in Appendix for acceptable tracking results.

4.8. Endo Cut When enabled, the unit's microprocessor will limit RF power based on how it senses tissue. Power output here is difficult to exactly test for. For information only.

4.9. Bipolar Mode

Note: The Cut foot pedal is shutout for bipolar. Use Coag pedal.

Connect the generator's bipolar output pair to the analyzer's active and return. Select "BIPOLAR" on the unit and set analyzer to 125 ohm ("heavy load"). Run the generator at various power settings and compare to the chart in the appendix. If a 50 ohm load is available, the bipolar output power will virtually track the COAG display setting.

4.10. Adjustable Tone Volume Control – on back of unit.

4.11. Auto Start (Bipolar Mode) Units are often shipped with this feature de-activated.
Select Auto Start. Touch both prongs of the bipolar forceps to a resistive load between 10 and 100 ohms. The unit should activate.

4.12. Other Safety Checks

Using the safety tester, check that line leakage with ground open is less than 50 uA.
Using the safety tester, check that ground lead resistance is less than 0.15 ohms.
Resistance between active and patient plate > 2megohms (yearly)

4.13. RF Leakage

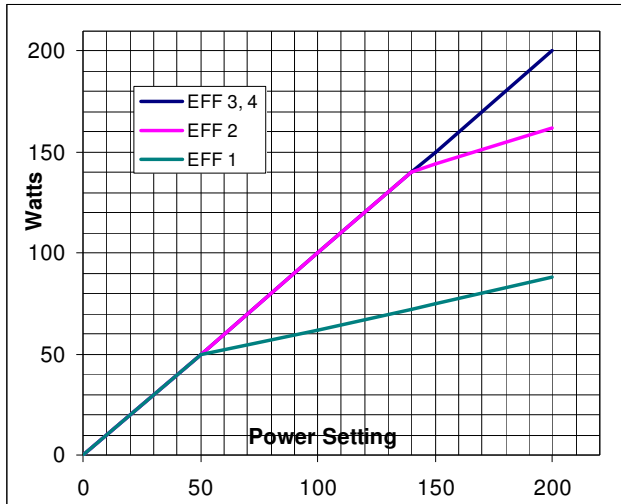
ESU analyzers read RMS current, and can display RF leakage. RF leakage is an infrequent field check but should not be overlooked for older equipment. The standard IEC 60601-2-2, particular requirements for the safety of high frequency surgical equipment, limits this to a maximum of 4.5 W measured on a 200 Ω non-inductive resistor for monopolar applications (150mA in this case).

APPENDIX

TYPICAL MONOPOLAR POWER CHARTS

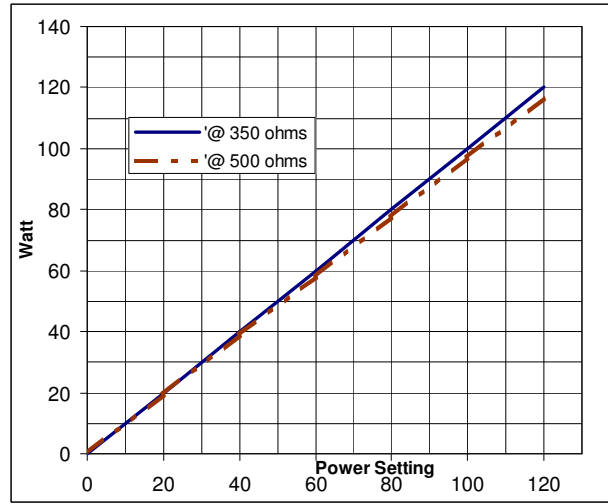
AUTO CUT MODE, Effect 1, 2, 3, 4

Power output as a function of the cut dial setting.
RL = 500 ohms; Range +/- 10%



FORCED COAGULATION

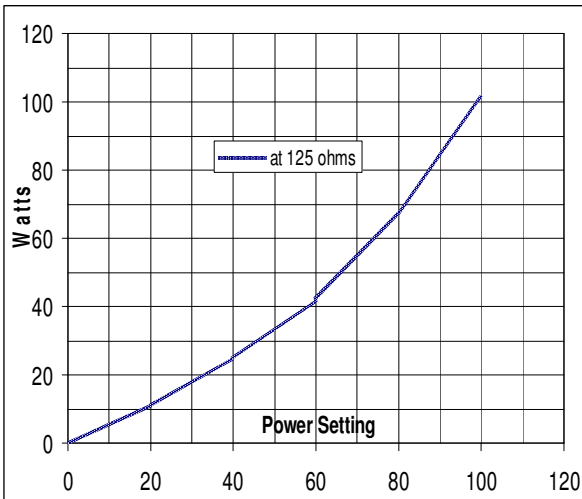
Power output as a function of coag dial setting.
RL = 350 ohms; Range +/- 15%



Warning: If using an oscilloscope, use the probe only in proximity.

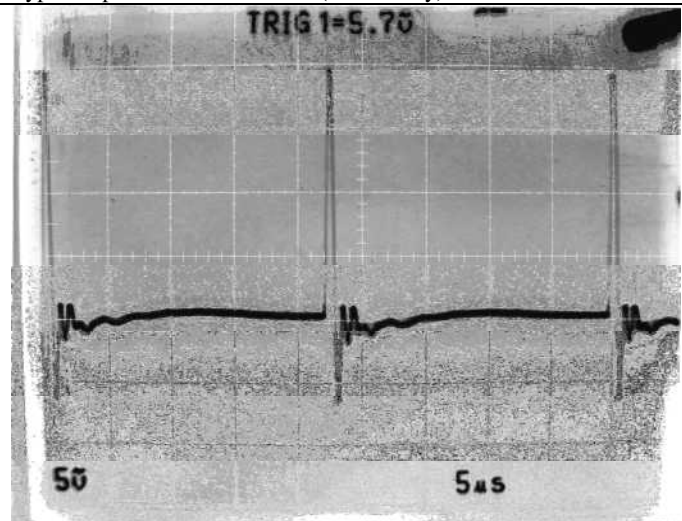
BIPOLAR OUTPUT VS POWER SETTING

RL = 125 ohms

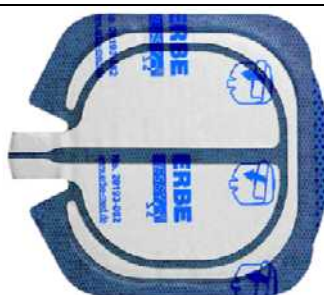


FORCED COAGULATION PEAK VOLTAGE

Typical open circuit waveform (for ref only).



Test Cable for Return Path



Clinical Patient Plate



Dempsey Analyzer